

$e$	9.29078	9.29078
$\sin E$	-9.93855	-9.93898
Radius in minutes	3.53627	3.53627
$e' \sin E$	-2.76560	-2.76603
Natural number	-582'.91 = -9° 42'.91	-583'.49 = -9° 43'.49
$E$	240° 14'	240° 20'
Deduced value of $M$	249 56.91	250 3.49
$dM$	+3.09	-3.49

We have thus, it will be seen, overstepped the true value of  $E$  in our estimate.

We have also

$1 - e \cos E$	0.04430	0.04416
$dM$	+0.48996	-0.54283
$dE$	+2'.790	-3'.153
$E$	240° 16'.790	240° 16'.847

The mean of these differs from the true value of  $E$  by only 0''.31. Using seven figure logs we find  $E = 240^\circ 16' 49''.41$ .

*Note on the Star  $\gamma$  Equulei.* By George Knott, B.A., LL.B.

In the spring of last year Mr. Hind pointed out to me that, in view of the Proper Motion of the star  $\gamma$  Equulei, there was ground for the inference that a small 11 mag. companion, detected by me in July 1867, was in physical connection with it. I have been hoping accordingly to obtain further measures of the pair, but have failed doing so until the present month.

I give below the results of the measures hitherto obtained by myself, together with a set by Mr. Burnham at an intermediate epoch:

1867.52	$P = 276.83$	$D = 2''.173$	Knott.
1867.57	276.85	2.089	—
1871.61	277.62	1.875	—
1877.72	274.5	2.1	Burnham.
1886.83	273.76	2.058	Knott.
1886.84	272.70	—	—

The measures of 1871.61 were taken under unfavourable circumstances, as appears from the note:—"B only to be seen on the most careful scrutiny; obs. most difficult." At my last epoch clouds came over before any measures of distance could be obtained. Mr. Burnham adds another small star, 12 mag., which I have not yet seen. His co-ordinates for it are:  $P = 10^\circ 0$ ,  $D = 41''.3$ , Ep. 1877.72. It seems desirable that this star should be re-measured.

If now we take\* the Proper Motion values assigned by Prof. Auwers, viz.:—in R.A.  $+0^s.0022$  and in Decl.  $-0''.167$ , and starting from the epoch 1867.54 compute the present values of P. and D. on the assumption that the companion does not share in the motion of the principal star, we get  $P=321^{\circ}.72$ ,  $D=4''.428$ . A comparison of these numbers with my latest measures points distinctly to the conclusion that a physical connection subsists between the objects. The series of measures as a whole appears further to indicate a slight but decided decrease in the angle of position of the companion in nineteen years, while no change would seem to have taken place in the distance.

Knowles Lodge, Cuckfield: 1886, November 10.

*On the Orbit of  $\Sigma$  1757. By J. E. Gore.*

I have computed the orbit of this binary star, by means of the graphical method, and find the following provisional elements:

*Elements of  $\Sigma$  1757.*

$P = 340^{\circ}.38$ years.	$\varpi = 89^{\circ} 45'.$
$T = 1778.81.$	$\lambda = 203^{\circ} 14'.$
$e = 0.2425.$	$a = 2''.25.$
$\gamma = 45^{\circ} 51'.$	$\mu = +1^{\circ}.057.$

The following is a comparison between the recorded observations, and the positions computed from the above elements:

Epoch.	Observer.	$\theta_0$	$\theta_e$	$\theta_0 - \theta_e$	$\rho_0$	$\rho_e$	$\rho_0 - \rho_e$
1825.37	Struve	$10^{\circ}.0$	$10^{\circ}.75$	$-0^{\circ}.75$	$1''.60$	$1''.38$	$+0''.2$
1829.82	„	$19^{\circ}.5$	$18^{\circ}.55$	$+0^{\circ}.95$	$1''.44$	$1''.45$	$-0''.0$
1832.39	Smyth	$24^{\circ}.1$	$23^{\circ}.0$	$+1^{\circ}.10$	$1''.5$	$1''.49$	$+0''.01$
1833.38	Struve	$23^{\circ}.9$	$24^{\circ}.6$	$-0^{\circ}.70$	$1''.54$	$1''.50$	$+0''.04$
1835.37	„	$25^{\circ}.5$	$27^{\circ}.6$	$-2^{\circ}.10$	$1''.66$	$1''.53$	$+0''.13$
1836.42	„	$29^{\circ}.4$	$29^{\circ}.1$	$+0^{\circ}.30$	$1''.64$	$1''.54$	$+0''.10$
1838.48	Smyth	$31^{\circ}.0$	$32^{\circ}.1$	$-1^{\circ}.10$	$1''.7$	$1''.60$	$+0''.10$
1841.38	Mädler	$36^{\circ}.0$	$36^{\circ}.1$	$-0^{\circ}.10$	$1''.74$	$1''.63$	$+0''.11$
1842.39	Dawes	$37^{\circ}.4$	$37^{\circ}.4$	$0^{\circ}.00$	$1''.67$	$1''.66$	$+0''.01$
1842.52	Smyth	$37^{\circ}.9$	$37^{\circ}.5$	$+0^{\circ}.40$	$1''.7$	$1''.66$	$+0''.04$
1843.45	Dawes	$38^{\circ}.8$	$38^{\circ}.75$	$+0^{\circ}.05$	—	$1''.69$	—
1843.51	Kaiser	$40^{\circ}.9$	$38^{\circ}.8$	$+2^{\circ}.10$	—	$1''.69$	—
1844.72	O. Struve	$43^{\circ}.7$	$40^{\circ}.2$	$+3^{\circ}.50$	$1''.89$	$1''.71$	$+0''.18$
1845.88	Mädler	$40^{\circ}.8$	$41^{\circ}.7$	$-0^{\circ}.90$	$2''.02$	$1''.74$	$+0''.28$

\* I am indebted for these numbers to Mr. Hind.